

# Exhibit G

# **Handwriting Identification: Facts and Fundamentals**

**Roy A. Huber  
A. M. Headrick**



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## **16. What Is a Fundamental or Significant Difference in Writing?**

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In a world of material things, virtually all things are different, if the examination of them is carried out at an appropriate level of precision. This is particularly so in the comparison of handwritings, for no two samples of the same text, by the same individual, with the same writing instrument, on the same date, and under the same writing and writer conditions will be identical in all respects. Such being the case, the document examiner or handwriting expert is constantly challenged by the same provocative questions, What is a difference and when does it become significant?

Much has been written on the subject of differences, but as McAlexander<sup>37</sup> points out, little has been provided to clearly establish for us what a fundamental difference is and what makes a difference significant. None of the widely recognized authorities on handwriting, Osborn, Hilton, Conway, Harrison, or Ellen, each of whom has spoken of differences and of the consideration they must be given, has provided definitions of the terms with which examiners might work. Osborn spoke of "divergences in amount and quality beyond the range of variation and not attributable to writing or writer conditions." He later says that writings by different persons will differ in some of the 27 particulars he lists. He then states that divergences in two specimens of writing may be found in "repeated individual or general characteristics" that will be indicative of different writers. None of the other authorities has been more precise.



Whiting<sup>38</sup> lamented the absence of adequate definitions in the literature and the imprecision of those that are offered to properly describe a fundamental difference, the term that is only too often used. While we would agree with his criticisms, he has not provided a better definition with which to work. We will make little progress, we submit, until the topic of differences has been more completely addressed.

Differences in writing are one of two kinds. There are what we may call *lucid* differences: those that are markedly distinct in quality or character. They are obvious. Among other things they include differences in allographs (i.e., letter designs), dimensions, slant, or letter construction. There are also *elusive* differences: those that are much less pronounced, more subtle, that do not reflect basic changes in design or structure.

There is merit in referring to lucid differences as disparities and in addressing elusive differences as divergences. Lexical definitions of these terms seem to make this selection appropriate. A *disparity* then, is a more pronounced difference in writings, while a *divergence* is a less pronounced or more subtle difference. Osborn used the word *divergence* in this fashion.

In Chapter 6, Section 30, we go to some length to list, organize, and describe all of the 21 aspects or attributes of handwriting that are employed in the identification of handwriting. We speak of and designate these 21 aspects or attributes of writing as being its discriminating elements, an element being defined as anything that is a part of a complex whole. Discriminating elements, then, are those parts of the complex whole of one's writing that can serve to differentiate between writers.

We also find that of these 21 discriminating elements, at least 17 of them may be segregated into one of two prime groups. First, there are seven elements of style, that include arrangement, class of allographs, connections, construction (including design and selection of allographs), dimensions, slant or slope, and spacings. Second, there are 10 elements of execution, that include abbreviations, alignment, commencements and terminations, diacritics and punctuation, embellishments, legibility or writing quality (including letter shapes or forms), line continuity, line quality, pen control, and writing movement.

Elements of style are those aspects of writing that are usually subject to direction in the learning or vocational process. Consequently, they are the aspects that may change with location, change with the school or the teacher, or change with the occupation of the writer. Elements of execution, on the other hand, are those aspects of writing in which personal idiosyncracies usually develop as a result of personal preferences, personal circumstances, and/or personal skills.

In a review of what has been said about differences, we find that *lucid* differences, or disparities, occur largely in the elements of style, whereas *elusive* differences, or divergences, occur largely in the elements of execution. It is also apparent that *lucid* differences, that we now call disparities, occur in those aspects of writing that are more fundamental to the writing process, whereas *elusive* differences, or divergences, are more personal aspects of the writing.

Disparities, when they occur, are more often attributable to a difference in writers. They are the distinctive and usually observable dissimilarities that emanate from different teachings, different backgrounds, or different practises. They include changes in allographs.

On the other hand, divergences, when they occur, are often the products of variation in the same writer, that may be either natural variation or variation due to some special cause. Divergences may also be simply the respects in which two individuals, subject to



the same influences, teachings or backgrounds, may differ from each other in the manner in which they execute a writing movement or manipulate the writing instrument, without actually changing the basic forms or letter structures. They are the subtle mutations observed in the graphs within writers or between writers. It might be said that disparities are differences that discriminate between groups, whereas divergences are differences that discriminate between members of a group.

Fundamental differences, then, will be disparities, which are dissimilarities that occur with respect to the elements of style, rather than the elements of execution. Accordingly, a proper definition of the term *fundamental difference* should narrow its perspective to the elements of style. In practise, one finds that changes in the elements of style are often accompanied by changes in patterns of execution. To avoid confusion, the assessment of differences should consider first the disparities that may be present in the elements of style. If they exist, they might constitute fundamental differences. If and when there are dissimilarities present in the elements of style, divergences in the elements of execution may be expected and placed in proper perspective as additional evidence of a different writer.

With these interpretations in mind a useable general meaning for a handwriting difference may be offered as follows:

Definition: In a comparison of questioned and known writings, a difference in a (questioned) writing is (1) a disparity in one of its discriminating elements of style or (2) a divergence in one of its discriminating elements of execution; either of which exceeds the expected range of natural variation for these elements within the writings with which it is being compared. In either case, the difference is otherwise inexplicable.

While this definition tells us what a difference is, it does not suggest why it is. Differences that are found must be studied and considered with respect to possible causes. They may be due to causes that tend to affect the elements of execution, such as those (1) due to writing conditions or other external factors, or those (2) due to internal factors such as age, illness, drugs or medications, or they may be (3) due to some attempt to disguise or to deliberately alter normal writing habits. They may, on the other hand, be true differences that are attributable to some fundamental discrepancy emanating from a different writing hand, more often observable in the elements of style.

There are differences, then, and there are fundamental differences, that make writings dissimilar from one another. Both must be considered insofar as the aspects of writing in which they are found.

Our definition of fundamental difference would be:

Definition: In a comparison of questioned and known writings, a fundamental difference in a (questioned) writing is a disparity in one of its discriminating elements, within the elements of style.

We might have qualified this definition and said, usually within the elements of form to allow for those few occasions in which there may be special differences in elements of execution. For example, in such features as the location of quotation marks, that would normally fall within the category of punctuation, we find that in some countries, these may be aspects of the system of writing taught.

If we are now better equipped to identify or describe a difference, what then is a significant difference?



Significance with respect to similarities, which is the evidence required to facilitate an identification, is determined by the frequency of occurrence of a feature or writing element in the writing of different persons. Significance, then, is a function of its rarity or uniqueness. It is a circumstance that has a potential for measurement, simply by collecting the empirical data relative to that frequency. There is no empirical data to be collected, however, that provides corresponding information respecting differences. What would we seek to count to measure the importance of a difference? What continuum or scale could be used on which to rank differences? How, then, can a difference, any difference, be classed as significant? Are not all differences of equal significance?

Much of what has been written respecting differences by the recognized authorities on handwriting identification has sung a somewhat similar tune with which most examiners are familiar: that even a single difference can outweigh a number of similarities. Hilton<sup>39</sup> stated:

"It is a basic axiom of identification in document problems that a limited number of basic differences, even in the face of numerous strong similarities, are controlling and accurately establish nonidentity."

Then, he goes so far as to say:

"A single significant difference between the (known and unknown) specimens is a strong indication of two writers, unless the divergency can be logically accounted for by the facts surrounding the preparation of the specimens."

Harrison<sup>40</sup> made similar comments:

"...the fundamental rule which admits of no exception when handwritings are being compared...is simple — whatever features two specimens of handwriting may have in common, they cannot be considered to be of common authorship if they display but a single consistent dissimilarity in any feature which is fundamental to the structure of the handwriting, and whose presence is not capable of reasonable explanation."

Then later, the point is reiterated:

"The rule that a single consistent dissimilarity, irrespective of the number and nature of the similarities which are demonstrable must exclude any possibility of common authorship may seem harsh, but in practise, it is exceptional for handwritings by different authors to be found to differ in but one material particular."

Conway<sup>41</sup> expressed the same theme when he wrote:

"A series of fundamental agreements in identifying individualities is requisite to the conclusion that two writings were authored by the same person, whereas a single fundamental difference in an identifying individuality between two writings precludes the conclusion that they were executed by the same person."

The common thread that these writings seem to exhibit is the importance attributed to a limited number of differences, perhaps only one. In the views of these authors, all and any fundamental difference (i.e., disparity) appears to carry the same weight, the magnitude

of which is sufficient to offset the weight of a number of similarities, regardless of their respective importance. Therefore, all differences must be deemed equally important and equally significant. If this line of thinking is correct there seems little need to pursue the question, What is a significant difference? Some differences, however, if not more significant are at least less disputable as being indicative of production by different writers.

### **17. What Circumstances or Conditions Might Contribute to the Production of Apparent Differences in Handwriting?**

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Osborn and others have generally agreed that despite numerous similarities in two sets of writings, a conclusion of identity cannot be made if there is one or more differences in fundamental features of the writings. Such statements have prompted the discussion above, in which we attempted to define a difference. If there are differences between writings, however, can we properly conclude that the writings are the products of different writers. Or, is it possible that some apparent differences are not true differences indicative of different authors, but simply variations of the same author resulting from extenuating circumstances?

The simple answer is, of course, yes. There are a number of extenuating circumstances that could be responsible. McAlexander and Maguire<sup>42</sup> have suggested a few. They, like most writers on handwriting identification have commented on the numerous changes in circumstances or conditions that may influence the written product, but few have ventured to say in what particular manners. To some extent this can be explained by the fact that, in the human experience, different factors can influence different people in different fashions. There are, however, some generalities that can be stated.

**Adequacy of standards.** In the pursuit of a reasonable explanation for the existence of an apparent difference in the comparison of questioned and known writings, the first consideration must be given to the adequacy of the standards to ensure that the full range of variations of which the writer is capable is represented. Not only must the standards be adequate in quantity, but they must be as contemporaneous as possible with the questioned writing. This is in order that the variables, due to conditions, circumstances, date, development, and maturity, of the writing will be controlled.

The contemporaneousness of the standards is the point most often proffered as the reason for apparent differences occurring in two writings. Because writing is susceptible to internal and external influences, the matching of circumstances between the questioned and known writings is vitally important. It can account for a difference in shape, in quality, or in particular movements.

**Accidental occurrences.** There are occurrences in writing that may have little or no plausible explanation. They may be unusual forms or movements, breaks in the writing line, even the doubling of some letters or parts of letters. They are more often minor in nature, infrequent, and of insufficient concern to the writer to warrant attention or correction. They are, frequently, completely erratic movements and may reflect a momentary interruption in neuromuscular coordination. Thus, accidental occurrences are best described as brief, temporary digressions from normal writing practises (see Accidentals in Section 15).



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**Alternative styles.** There are individuals that are said to be versatile writers, that have more than one style of writing, perhaps cursive and script or cursive and lettering. The second may be prompted by a particular type of occupation such as architecture that requires lettering. On occasion, relapses occur wherein a change will be made in a letter or a word. More often than not, these incidents will be observed in reasonably skillful executions of extended writing. Changes to a second distinctive style are not normally expected in writings, but are found in signatures on infrequent occasions, as Hilton illustrated. Other instances have been reported, as well, wherein such changes were accomplished. Whiting<sup>43</sup> describes and illustrates the differences in two styles of writing and signing executed by one individual using two identities. Confirmation that the two identities were, in fact, the same person was provided by a fingerprint comparison.

Without elucidating further on what was meant by *styles* or how they differed, Bohn<sup>44</sup> reported that the FBI Laboratory (or himself) had encountered "...frequent instances where one person can adopt or employ two or more entirely divergent styles or systems of writing..." He cautioned that for this reason the examiner "...must make a careful evaluation to determine whether an apparent difference is truly a fundamental difference...."

McCarthy<sup>45</sup> claimed that it is easier for a poor writer to consistently change letter forms while printing than it is for a highly skilled cursive writer, since habit is not so intrinsically established. For the unskilled person who prints, the act is not fluent but more in the nature of drawing.

**Ambidexterity.** Some, but not many individuals, especially among those persons that have converted from sinistrals to dextrals at some point, have the ability to write with either hand with almost equal dexterity. In most respects, the written products are similar. Muscular coordination of the two hands and arms may not be precisely the same, however, and differences in fluency and some movements may be noted.

Since society and its educational systems now tolerate left-handed writing in children, the expectation is that in the future there will be a reduction in the number of ambidextral writers. Whether this occurs we will probably never know, for we lack the necessary data to tell us.

**Carelessness or negligence.** Most writers have occasions when their writing degenerates to a scrawl or scribble due to haste, carelessness, or particularly poor writing circumstances. These executions are usually confined to short notes, addresses, and telephone numbers. Often they are inscribed on small note pads, envelopes, and segments of paper. They frequently contain elements of a person's writing that are unusual or accidental. They may never appear again in another example. They are unreliable indicators of normal writing habits or of a writer's normal range of variation.

**Changes in health condition of writer.** Depending on its nature, changes in health may affect the fluency, rather than the designs of writing. The changes can be expected to be temporary, however, and writing facility will likely return with the recovery of health. The deterioration of health generally is another matter and its progress may vary with the individual. Its effect is usually observed in a loss of control and the introduction of more erratic movements. This is one of the aspects that has a bearing on the adequacy of standards.



**Changes in physical condition of writer — fractures, fatigue, and weakness.** Fractures of the hand and arm, requiring restraints on mobility that inhibit the grasp of the instrument or the movement of the pen will, of course, alter the written product. When movement has been restricted for long periods, the full use of the member, when restrictions are removed, may not be immediately regained.

Our experience has included instances in which individuals suffered such serious injury to the writing hand or arm that he/she was obliged to rely on whatever ability could be developed hastily with the nondominant hand and arm. The quality of the writing is poor in such cases, but depending on the duration of the incapacitation, a measure of skill can be acquired. The differences in the writing should be obvious, of course, but as we have said elsewhere there are numerous writing habits that will persist in the writing of the nondominant hand.

Studies have also shown that fatigue and weakness have their effects upon the control of the writing instrument and its performance may be altered in unpredictable fashions. These too, are aspects that have a bearing on the adequacy of standards.

**Changes in the mental condition or state of the writer.** As we have noted elsewhere, schizophrenics and/or persons with multiple personalities can exhibit major changes in their writing on different occasions corresponding to the mental state at the time. These are changes not so much in kind as in quality. A change to a childhood state will be accompanied by a corresponding childlike or immature quality of writing (see *Influences on Writing: Instability*).

**Concentration on the act of writing.** Concentration on the writing act will, of course, render it to be a more conscious process, and consciousness steals from fluency. The action becomes more deliberate and slower. The change will be noted in line quality unless the reason for concentration is due to uncertainty as to the letters or text to be written that may interrupt the writing process more profoundly.

It is said that for some people the nature of a document can have an effect upon the writing of signatures applied to it. Certainly wills, mortgages, large contracts, and real estate transactions are significant events in the lives of many persons, and it is understandable that the signing of such documents will be a more conscious act than it is in signing many others. Nevertheless, no one ventures to describe precisely what that effect may be. In our casework experience, it has been similar to the effect of tension, duress, or concentration on the writing process that is evident largely in some loss of fluency and line quality. When care is exercised, there can be a greater respect shown for copybook styles (see Section 38: *Intrinsic Influences*).

**Disguise or deliberate change.** Disguise or deliberate change will produce the more pronounced results. This will not be an isolated change, however, but will be the kind of modification that tries to exhibit itself throughout the writing. It is frequently suggested as an explanation for differences, but since it is an intentional change it is questionable whether it belongs in this particular part of our dissertation. We have chosen to deal with it in Section 52: *The Disclosures of Disguise*.

**Drugs or alcohol.** See Section 38: *Intrinsic Influences*.

**Influence of medications.** See Section 37(F): *Extrinsic Influences*.



**Intentional change for later denial.** This subject has been dealt with under the caption of Autoforgery (see Section 49). There we describe the remoteness of an occurrence of this kind. Nevertheless, and notwithstanding the few instances in which a person might be disposed to fabricate an irregular signature of this kind, there are numerous other instances in which a faulty memory coupled with a minor irregularity in the writing may induce an individual to honestly or dishonestly deny its execution. The handwriting examination on these occasions must address the issues of natural variation, accidental occurrence, deliberate modification, and true difference.

**Nervous tension.** See Section 37(H): Extrinsic Influences — Emotional Stress.

**Natural variations — beyond those of standards.** This is the reason that the adequacy of standards is particularly important. Limited standards may not contain the full range of natural variations peculiar to a given individual simply because some variations are the products of the time, the text and the circumstances involved in their production. The fewer the standards, the more likely that this situation will occur.

**Writing conditions — place or circumstances (moving vehicles).** There is wide variation in the circumstances under which legitimate signatures are written and almost equal variation in the results. Recipient signatures for deliveries received are invariably executed in a standing position without adequate support for the writing surface. Furthermore, they are confined to small spaces on forms quite inadequate for the majority of writers. The result is a pronounced change in execution, often so altering the signature that it is beyond a subsequent identification.

Although it is true that these signatures are executed with less care and concern for the final product, the affect that these unusual circumstances may have upon the writing is more severe than that which carelessness and negligence normally generates. Harrison expounds that:

“...it is not surprising that when specimens of the handwriting of one person written under different conditions are compared, there should be a doubt expressed that one individual was responsible for writing all the scripts, so different do they appear.”<sup>46</sup>

Signatures executed at counters may have similar effects. Tables and chairs provide a reasonably consistent set of circumstances for the signing of documents, although there are exceptions to the rule. Counters, however, do not. They vary in height, as do the people attempting to write on them. They are sometimes narrow and restrictive for the writing process. Consequently, the writer's stance with respect to the document is subject to wider variation and the results can be a loss of some quality or control.

Related to this are the situations in which a writer, because of ill health, endeavours to execute a signature when confined to bed (see Section 57, Signs of Senility or Age). In other situations, an individual may attempt to write or sign a document on his/her knee or lap. For some writers, even the environmental circumstances can have some affect upon the nervous state of the individual and fluency in the writing may suffer.

Writings in moving vehicles of all kinds are remarkably numerous or at least claimed to be so. Depending on the nature of the vehicle, the influence of its motion may be minor or extreme. When extreme the writing may be quite erratic. Whichever it is, the effect will be



general and likely apparent throughout the writing rather than localized to one or two elements. While writings in moving vehicles and other extreme circumstances do occur, it is more often a claim made to explain deficiencies or disparities in spurious signatures in an argument for their being genuine (see Section 38(2): Intrinsic Influences — Circumstantial).

This is another important aspect of writing that has a bearing on the adequacy of standards.

**Writing instrument.** See Section 38(2): Intrinsic Influences — Circumstantial.

**Writing position — including stance.** See Writing Conditions.

**Writing surface.** See Section 38(2): Intrinsic Influences — Circumstantial.

**Writing under stress.** In this we differentiate, as we must, between the effects of emotional stress and those of physical stress. The former is dealt with under the caption Mental State of the Writer Section 37(H). The latter is more often described as fatigue, and cases involving the writing of documents while suffering from extreme fatigue are rarely encountered. Physical stress is dealt with in detail in Section 38(C).

## 18. Is It Possible, Then, to Eliminate a Person as Being the Writer of an Inscription or Signature on a Document?

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Writing examinations usually have one of three objectives: identification, elimination, or differentiation. Identification is a process that associates writings, for a purpose. Elimination segregates writings, for a purpose. Differentiation segregates writings, for no particular purpose, beyond making the distinction.

Differentiation is a seldom-mentioned process that lies at the root of studies to establish whether or not writings are the products of two or more persons, as they may purport. Marked ballots, testimonials, voter's lists, and other documents are often involved. In these cases, differentiation, when achieved, usually attests to genuineness. On the other hand, common authorship, when established, may be cause to reject a document as invalid, without any necessity to pursue its authorship further.

Differentiation is the objective that proves the heterogeneity of writing and the ability of the present processes to demonstrate it. Thus, it is a key to the validity and reliability of handwriting examination.

The term *nonidentity* is often used interchangeably with *elimination*. Differentiation, however, is also a matter of nonidentity. Thus, while elimination may be a matter of nonidentity, nonidentity is not solely a matter of elimination. Accordingly, it is more fitting to say that nonidentity is the all-inclusive parent of both elimination and of differentiation.

An identification is based on evidence that is quantitatively and qualitatively sufficient to support such a conclusion. The elimination of a writer may be based on what is quantitatively less evidence, or on an absence of evidence of identification in the documents at hand. It embraces speculation as to what other documents by the same writer might reveal, if they were available. Eliminations are broad and all-inclusive statements, that a given writer could not, under any circumstances, have executed a given writing. Identifications are particular and demonstrable. Eliminations are general and speculative.



An important key in the elimination of a writer rests in the contemporaneousness of the standards. Because writing is dynamic and subject to change over periods of time, it is crucial to have within the standards some samples of writing that are contemporaneous with the questioned document.

Because an elimination is such an all-encompassing statement it has been recommended that the conclusion, when expressed, should always be qualified. Rather than a bold statement that "K" did not write "Q," it is suggested that the finding should read in words to the effect that, "In the writing standards at hand there is no evidence that "K" was the writer of "Q."

There are situations in which unqualified eliminations seem to be justified. An individual cannot be considered a potential author of a writing that exceeds the level of skill of which he/she is capable, providing the standards reliably attest to that level. Nor should an individual be considered for authorship of a writing that contains numerous fundamental disparities in the basic system followed that indicates a difference in national or system attributes, providing the standards are contemporaneous. It is also reasonable to exclude a person as the author of a tracing of his own signature, but while tracings usually mitigate against a conclusion of auto-forgery, grounds are insufficient to say that it couldn't happen.

It has been implied that the processes of identification and elimination are the same. With this we would agree, but only in the sense that the same discriminating elements, sought and appraised in the Analysis and Comparison, will provide the evidence of sameness or difference in the writing comparisons. The analogy between the two tasks, however, stops there. Although, in practice, the approach to both tasks may be the same, the physical evidence to be considered and its assessment is distinctly different. Identification is an evaluation of similarities. Elimination is an evaluation of differences.

Differences found in writing studies cannot be underestimated. On the other hand, the contention that a single or a few basic differences are controlling and can offset the weight of several similarities may be an overestimation of their role. Although basic differences are frequently considered to constitute adequate grounds for the "elimination of a writer" or a conclusion of "nonidentity," such findings may be more complicated than the simple tabulation of a few disparities between two sets of writings. As Dick<sup>47</sup> stated, and Dibowski<sup>48</sup> and Miller<sup>49</sup> reiterated, a conclusion of elimination may be more difficult, more complex, or have greater risks than that of identification.

It must be emphasized that the apparent differences in two sets of writings that might be indicative of writings originating from different sources (writers), are seldom found in isolation. If one is present, a thorough examination will likely reveal others. An isolated difference is more often due to one or more of the circumstances and situations suggested in Section 17: What circumstances or conditions might contribute to the production of apparent differences in writing.

The position taken by most authorities is that to properly support a conclusion of nonidentity or elimination, differences must be fundamental and repeated. Accordingly, such conclusions can seldom be justified respecting limited textual material as the opportunity for differences to be repeated may not be provided. Disparities in writing can occur for numerous reasons, and the consideration of all of those reasons is what makes eliminations a more complex matter than identifications may be.

When differences are numerous and persistent, and the standards in which they are present are adequate quantitatively and qualitatively, such differences must be entertained



as evidence in support of the elimination of the writer. Osborn went so far as to say that, "If two writings cannot be identified as the same then, necessarily, they must be identified as having been written by different hands." In our view, whether an elimination is definitive or qualified must remain a subjective judgment on the part of the examiner. The benefit to the court, the counsel, or to the investigator should be virtually the same in both instances, and the qualified conclusion will avoid indeterminable risks.

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